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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,567	05/02/2001	Krishna Balachandran	18-10-25-3-51	5619

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EXAMINER

MOORE JR, MICHAEL J

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,567

Applicant(s)

BALACHANDRAN ET AL.

Examiner

Michael J. Moore, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 13-16 and 23-26 is/are rejected.
- 7) ☒ Claim(s) 7-12 and 17-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims **1 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (U.S. 2002/0054578) ("Zhang").

Regarding claims **1 and 3**, Zhang teaches a delay-bounded ARQ method on page 5, paragraph 84 where if a packet does not arrive after a certain time interval (play out time), the recovery is given up (aborted) and the loss is passed (acknowledgement) to higher layers. Zhang does not explicitly express the certain time interval (play out time) as a function of block size, play out rate, and allowed delay for each transmission. However, it would be obvious to someone skilled in the art to base the play out time on

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parameters such as these in order to effectively regulate block recovery in accordance with each specific transmission.

4. Claims **4-6, 13-16, and 23-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (U.S. 2002/0054578) ("Zhang") in view of Furuskar et al. (U.S. 6,704,898) ("Furuskar").

Regarding claims **4-6**, Zhang teaches the method of claim 1. Zhang also teaches the use of ARQ and FEC as two error correction mechanisms on page 5, paragraph 83. Zhang does not explicitly teach the initial transmission of a first plurality of copies derived through different puncturing nor subsequent transmissions of a second plurality of copies selected to maximize a streaming rate under loss and delay constraints.

However, Furuskar teaches an ARQ method in Figure 3 where a block is initially transmitted (step 322) using a puncturing scheme P_1 and then upon no receipt of an ACK signal (step 324), the block is retransmitted (step 326) using a different puncturing scheme P_2 and further with a different puncturing scheme P_3 (step 330) as spoken of on column 4, line 59 – column 5, line 11. At the time of the invention, it would have been obvious to someone skilled in the art to combine the teachings of Zhang with the ARQ puncturing teachings of Furuskar in order to provide added redundancy to increase the chance of data recovery at the receiver.

Regarding claims **13-16**, Zhang teaches a delay-bounded ARQ method on page 5, paragraph 84 where if a packet does not arrive after a certain time interval (play out time), the recovery is given up (aborted) and the loss is passed (acknowledgement) to

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higher layers. Zhang further teaches on page 12, paragraph 182 how in the delay-constrained ARQ method, a maximum number of retransmissions N_{\max} for a current packet is determined based on a delay constraint $D_{\text{constrained}}$ (delivery delay of service), the current roundtrip transmission time RTT (round trip delay), and the estimated processing time $D_{\text{processing}}$.

Zhang does not explicitly teach the initial transmission of a first plurality of copies derived through different puncturing nor subsequent transmissions of a second plurality of copies selected to maximize a streaming rate under loss and delay constraints. However, Furuskar teaches an ARQ method in Figure 3 where a block is initially transmitted (step 322) using a puncturing scheme P_1 and then upon no receipt of an ACK signal (step 324), the block is retransmitted (step 326) using a different puncturing scheme P_2 and further with a different puncturing scheme P_3 (step 330) as spoken of on column 4, line 59 – column 5, line 11.

At the time of the invention, it would have been obvious to someone skilled in the art to combine the teachings of Zhang with the ARQ puncturing teachings of Furuskar in order to provide added redundancy to increase the chance of data recovery at the receiver.

Regarding claims **23-26**, Zhang teaches a delay-bounded ARQ means (server and client) in Figure 5b and a associated method on page 5, paragraph 84 where if a packet does not arrive after a certain time interval (play out time), the recovery is given up (aborted) and the loss is passed (acknowledgement) to higher layers. Zhang further teaches on page 12, paragraph 182 how in the delay-constrained ARQ method, a

maximum number of retransmissions N_{\max} for a current packet is determined based on a delay constraint $D_{\text{constrained}}$ (delivery delay of service), the current roundtrip transmission time RTT (round trip delay), and the estimated processing time $D_{\text{processing}}$.

Zhang does not explicitly teach the initial transmission of a first plurality of copies derived through different puncturing nor subsequent transmissions of a second plurality of copies selected to maximize a streaming rate under loss and delay constraints. However, Furuskar teaches an ARQ method in Figure 3 where a block is initially transmitted (step 322) using a puncturing scheme P_1 and then upon no receipt of an ACK signal (step 324), the block is retransmitted (step 326) using a different puncturing scheme P_2 and further with a different puncturing scheme P_3 (step 330) as spoken of on column 4, line 59 – column 5, line 11.

At the time of the invention, it would have been obvious to someone skilled in the art to combine the teachings of Zhang with the ARQ puncturing teachings of Furuskar in order to provide added redundancy to increase the chance of data recovery at the receiver.

Allowable Subject Matter

5. Claims **2, 7-12, and 17-22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim **2**, the prior art of record teaches the method of claim **1**. The prior art of record fails to teach where the play out time $p(n)$ at a receiver is defined by the claimed equation.

Regarding claim **7**, the prior art of record teaches the method of claim **6**. The prior art of record fails to teach where if an amount of new data available to an RLC of the transmitter is less than a total number of bits that can fit into a space of an RLC block, then the RLC of the transmitter waits until enough data becomes available.

Regarding claim **8**, the prior art of record teaches the method of claim **6**. The prior art of record fails to teach where if an amount of new data available to an RLC of the transmitter is less than a total number of bits that can fit into a space of an RLC block, then the RLC of the transmitter uses a more robust modulation and coding.

Regarding claims **9-12**, these claims are further limiting to claim **8** and are thus also allowable over the prior art of record.

Regarding claim **17**, the prior art of record teaches the method of claim **16**. The prior art of record fails to teach the adding of an update time reference (UTR) bit to an RLC/MAC header and to each initial transmission of an RLC block.

Regarding claims **18-20**, these claims are further limiting to claim **17** and are thus also allowable over the prior art of record.

Regarding claim **21**, the prior art of record teaches the method of claim **16**. The prior art of record fails to teach where if an amount of new data available to an RLC of the transmitter is less than a total number of bits that can fit into a space of an RLC block, then the RLC of the transmitter waits until enough data becomes available.

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Regarding claim **22**, this claim is further limiting to claim **21** and is thus also allowable over the prior art of record.

Response to Arguments

7. Applicant's arguments with respect to claims **1 and 3** have been considered but are moot in view of the new ground(s) of rejection provided above.

Conclusion

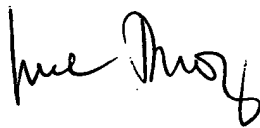
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Balachandran et al. (U.S. 6,895,057), Whitfield (U.S. 6,693,921), Jain (U.S. 6,259,677), and Fried et al. (U.S. 6,735,192) are references pertinent to this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Moore, Jr. whose telephone number is (571) 272-3168. The examiner can normally be reached on Monday-Friday (8:30am - 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached at (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



FRANK DUONG
PRIMARY EXAMINER

Michael J. Moore, Jr.
Examiner
Art Unit 2666

mjm MM